

REMARKS/ARGUMENTS

Claims 1-3, 7, 9, 10, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over MASUMOTO (U.S. 5,418,583) and O'BRIEN ET AL. (WO 03/064919). Claims 4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over MASUMOTO in view of applicant's admitted prior art. Claims 11, 13-16, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over MASUMOTO and O'BRIEN ET AL.

1. Objections to claim 1:

Claim 1 is objected to because of the following informalities: typographical error: "having a optical axis".

Response:

Claim 1 and claim 11 have been amended to correct the typographical error as shown in the Amendments to the Claims section above. Acceptance of the amended claims 1 and 11 is respectfully requested. No new matter is added.

2. Rejection of claims 1-3, 7, 9, 10, 17 and 18 under 35 U.S.C. 103(a):

Claims 1-3, 7, 9, 10, 17 and 18 are rejected under 35 U.S.C. 103(a) as being anticipated by MASUMOTO and O'BRIEN ET AL. for reasons of record, as recited on pages 2-3 of the above-indicated Office action.

Response:

Claim 1 has been amended to specifically describe the optical structure of the present application. The limitations of "a light source housing surrounding a portion of the light source" and "the included angle being about 45 to 79 degrees so as to reduce an

amount of light reflected back to the light source housing” added to claim 1 can be supported by the specification and the drawings, and no new matter is added.

According to the amended claim 1, a light source module is provided. The light
5 source module comprises a light source for generating light beams, a first lens array
having an optic axis positioned on a side of the light source, a light source housing
surrounding a portion of the light source, and an invisible-light cut filter positioned on a
side of the first lens array away from the light source. The invisible-light cut filter and the
optic axis of the first lens array have an included angle, and the included angle is about 45
10 to 79 degrees so as to reduce an amount of light reflected back to the light source housing.

The invisible-light cut filter of the present invention is positioned away from the first
lens array, so there is enough space for the invisible-light cut filter to have a preferable
inclination angle, which can control the reflection angle of invisible light reflected by the
15 invisible-light cut filter. Generally speaking, as the light beams propagate to the
invisible-light cut filter, most part of the light beams passes approximately along the optic
axis of the first lens array in the present application, and therefore **most of the light
beams penetrate through the invisible-light cut filter at an incident angle about 11 to
45 degrees**. Accordingly, invisible light will be reflected by the invisible-light cut filter
20 with a reflection angle about 11 to 45 degrees. **The total amount of invisible light
reflected back to the light source or the space inside the light source housing can
therefore be reduced, and furthermore, the temperature inside the light source
housing and the temperature of the light source can be effectively decreased.**
Consequently, the lifetime of the light source module can be lengthened and the elements
25 of the light source module and other device of projectors can be also protected (paragraph
[0018]). In sum, **because the invisible-light cut filter and the optic axis of the first lens
array have an included angle about 45 to 79 degrees, the light source module can
reduce an amount of light reflected back to the light source housing, and the lifetime**

of the light source module can be lengthened.

MASUMOTO discloses an invisible-light/UV/IR cut filter 105 perpendicular to the first lens array 4 and perpendicular to the optical axis of the first lens array 4 (Figs. 15-17). Therefore, according to the projector taught by MASUMOTO, **the most of light beams should penetrate through the invisible-light cut filter 105 at an incident angle about 0 degree so that invisible light would be reflected in a reflection angle of 0 degree and directly passes into the light source 1 along the dotted line (optic axis) in Fig. 15-17.** Thus, the projector does not able to decrease the energy of invisible light reflected back to the light source 1 or the space inside the reflective housing 3, and cannot lengthen the lifetime of the light source module.

O'BRIEN discloses a light cover comprising an infrared filter 12. According to Fig. 2 and pages 3-5 in the specification, **O'BRIEN ET AL utilize the infrared filter 12 to reflect a substantial proportion of the infrared radiation, indicated by the chain arrow 24, toward the rear of the housing 18.** The angle of the infrared filter 12, indicated by angle A, is carefully selected to direct the reflected infrared radiation toward a non-critical part of the housing 18. Therefore, infrared radiation reflected by the infrared filter 12 propagates inside the housing 18 that contains the light source 16. Furthermore, O'BRIEN does not specifically teach the invisible-light cut filter and the optic axis of the first lens array having an included angle about 45 to 79 degrees.

Examiner pointed, "Applicant argues that MASUMOTO and O'BRIEN do not disclose a filter installed at a position further away from the light source or that do not reflect light into the reflective housing. However, it is noted that the features upon which applicant relies are not recited in the rejected claim(s)". Please reconsider that the limitation of "an invisible-light cut filter positioned on a side of the first lens array away from the light source" has been disclosed in claim 1, and the limitation of "an

invisible-light cut filter positioned between the first lens array and the second lens array” has been disclosed in claim 11. The limitation of “the included angle being about 45 to 79 degrees so as to reduce an amount of light reflected back to the light source housing” is added to claims 1 and 11.

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Examiner pointed “Moreover, Applicant has not disclosed that the specifically claimed angle solves any stated problem or is for any particular purpose and it appears as though the claimed invention would perform equally well with the angled filter of O’BRIEN”. Please reconsider that the limitation of “the included angle being about 45 to 10 79 degrees so as to reduce an amount of light reflected back to the light source housing” is added to claims 1 and 11, and this limitation discloses the particular purpose for the specifically claimed angle.

Examiner pointed “Applicant argues that a filter included angle about 45 to 79 15 degrees from a lens array distinguishes the claimed invention. However, the critical aspect of the concept, i.e. angling a filter to strategically direct reflected radiation, is taught via O’BRIEN (Fig. 2; Page 4, Paragraph 3). Determining an ideal/specific angle of the filter is the work of a skilled engineer and not that of an inventor”. However, the inventors (or the skilled engineers) of the cited references do not bring out an 20 ideal/specific angle of the filter for decreasing the temperature inside the light source housing. In the prior art, such as the projector taught by MASUMOTO, **invisible light would be reflected in a reflection angle of 0 degree and directly passes into the light source 1.** Usually, the light source is one of the most important components in a projector, and is also one of the most easily broken components in the projector. Applicant found 25 out that the light source is often broken under high temperature inside the light source housing, and then brought out the claimed structure of the present application for reducing an amount of light reflected back to the light source housing. The specifically claimed angle is a concrete description of an embodiment in the present application to

decrease the temperature, and applicant believes that the cited references do not teach all the limitations disclosed in claims 1 and 11.

Neither MASUMOTO nor O'BRIEN teaches the invisible-light cut filter and the
5 optic axis of the first lens array having an included angle about 45 to 79 degrees, so the combination of MASUMOTO's disclosure and O'BRIEN's disclosure is different from the present application. The light source module in the amended claim 1 is set for reducing an amount of light reflected back to the light source housing, but MASUMOTO's disclosure and O'BRIEN's disclosure do not suggest to solve this
10 particular problem.

Therefore, the combination of MASUMOTO's disclosure and O'BRIEN's disclosure does not disclose all the limitations of the structure in the amended claim 1, and the functions of the present application are also different from MASUMOTO's disclosure and
15 O'BRIEN's disclosure. Since MASUMOTO does not teach the invisible-light cut filter and the optic axis of the first lens array having an included angle about 45 to 79 degrees, and never provides a solution to reduce the total amount of light reflected back to the light source housing, the amended claim 1 should be allowable in consideration of 35 U.S.C. 103(a). Reconsideration of claim 1 is respectfully requested.

20 Since claims 2-3, 7, 9, 10, 17 and 18 are dependent upon the amended claim 1, they should be allowable if the amended claim 1 is allowable. Reconsideration of claims 2-3, 7, 9, 10, 17 and 18 is respectfully requested.

25 **2. Rejection of claims 4 and 8 under 35 U.S.C. 103(a):**

Claims 4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over MASUMOTO as applied to claim 1 above and further in view of applicant's admitted prior art for reasons of record, as recited on page 3 of the above-indicated

Office action.

Response:

The Examiner points that applicant's admitted prior art discloses a PS converter and a high-pressure mercury lamp. However, claim 1 has been amended to contain the limitation of "the invisible-light cut filter and the optic axis of the first lens array having an included angle about 45 to 79 degrees so as to reduce an amount of light reflected back to the light source housing". Because the structure of MASUMOTO's disclosure is different from the light source module of the amended claim 1, the combination of MASUMOTO's disclosure and a PS converter or a high-pressure mercury lamp is still different from the present application. Thus, the amended claim 1 should be allowable in consideration of 35 U.S.C. 103(a). Since claims 4 and 8 are dependent upon the amended claim 1, they should be allowable if the amended claim 1 is allowable. Reconsideration of claims 4 and 8 is respectfully requested.

3. Rejection of claims 11, 13-16, 19 and 20 under 35 U.S.C. 103(a):

Claims 11, 13-16, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over MASUMOTO and O'BRIEN ET AL. for reasons of record, as recited on pages 3-4 of the above-indicated Office action.

Response:

Claim 11 has been amended to specifically describe the optical structure of the present application. The limitations of "a light source housing surrounding a portion of the light source" and "the included angle being about 45 to 79 degrees so as to reduce an amount of light reflected back to the light source housing" added to claim 11 can be supported by the specification and the drawings, and no new matter is added.

According to the amended claim 11, a light source module is provided. The light

source module of a projector comprises a light source for generating light beams, a first lens array having an optic axis positioned on a side of the light source, a second lens array positioned on a side of the first lens array away from the light source, a light source housing surrounding a portion of the light source, and an invisible-light cut filter positioned between the first lens array and the second lens array. The invisible-light cut filter and the optic axis of the first lens array have an included angle, and the included angle is about 45 to 79 degrees so as to reduce an amount of light reflected back to the light source housing.

Referring to MASUMOTO's application, as known by those skilled in the art, **the most of light beams should penetrate through the invisible-light cut filter 105 at an incident angle about 0 degree so that invisible light would be reflected in a reflection angle of 0 degree and passes into the reflective housing 3 along the optic axis in Fig. 15-17.** Thus, the projector does not able to decrease the energy of invisible light reflected back to the space inside the reflective housing 3, and cannot lengthen the lifetime of the light source module.

O'BRIEN disclosures a light cover comprising an infrared filter 12. According to Fig. 2 and pages 3-5 in the specification, O'BRIEN ET AL utilize the infrared filter 12 to reflect a substantial proportion of the infrared radiation *toward the rear of the housing 18*. **The angle of the infrared filter 12 is carefully selected to direct the reflected infrared radiation toward a non-critical part of the housing 18.** Accordingly, O'BRIEN does not specifically teach the invisible-light cut filter and the optic axis of the first lens array having an included angle about 45 to 79 degrees, and infrared radiation is reflected inside the housing 18 by the infrared filter 12.

In contrast, **the invisible-light cut filter of the present application is installed at a position farther away from the light source**, and the invisible-light cut filter and the

5 optic axis of the first lens array have an included angle about 45 to 79 degrees, **so that most of invisible light will not be reflected into the reflective housing and not reflected to the vicinity of the light source.** Accordingly, the energy of invisible light reflected back to the light source will be effectively decreased and the lifetime of the light source module will be thereby lengthened [0009].

10 The Examiner points that MASUMOTO does not disclose an invisible-light/UV/IR cut filter, but O'BRIEN teaches arranging an IR filter at an angle of about 11 to 45 degrees for the purpose of preventing reflection of light back to the light source and thus avoiding damage to the light source. However, the combination of MASUMOTO and O'BRIEN never discloses an optical structure including an invisible-light filter and a lens array that have an included angle about 45-79 degrees with each other, and does not teach that the invisible-light cut filter reduces an amount of light reflected back to the light source of to the light source housing. **The structures of cited references reflect light**
15 **beams into the reflective housing, but the present application reduces the amount of light reflected back to the light source surrounded by the light source housing.** Furthermore, the light cover in O'BRIEN's disclosure is applied to an aircraft operator (pages 1-2). Since O'BRIEN never mentions or suggests that the light cover should be applied to a projector, O'BRIEN's disclosure is neither in the field of applicant's endeavor,
20 nor reasonably pertinent to the particular problem with which the inventor was concerned. Accordingly, the amended claim 11 should be allowable in comparison with the combination of the cited references.

25 Since claims 13-16, 19 and 20 are dependent upon the amended claim 11, they should be allowable if the amended claim 11 is allowable. Reconsideration of claims 13-16, 19 and 20 is respectfully requested.

Appl. No. 10/709,845
Amdt. dated November 16, 2006
Reply to Office action of August 18, 2006

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Sincerely yours,

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Date: 11/16/2006

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